VEXVE
Valves World Wide

30.03.2010

Vexve Balancing Valve User Manual

Table of Contents

1. General
2. Precautions and Notifications
3. Markings
4. Valve Transportation and Storage
5. Installations and Welding to the Pipeline
    5.1 Welding
6. Commissioning and Use
    6.1 Calculating the Pre-Set Values
    6.2 Setting the Pre-Set Values
    6.3 Flow Measuring
7. Maintenance
    7.1 Assembly/Disassembly of Manual Gear
        7.1.1 Adjusting of Manual Gear
8. Maximum Allowable Pressure at Different Temperatures
9. Kv Value Chart
10. Materials

1. General

Vexve Balancing Valves (Colour blue)

Vexve steel balancing valve is designed for clean mediums and to be used in district heating and cooling pipelines. The valve is designed for applications where the water is oxygen-free or e.g. for glycol-based applications. Please consult with the manufacturer on other applicable applications.

The valve body is from pressure equipment steel. The shaft and ball are manufactured from the stainless steel material. The ball seals are carbonized Teflon (PTFE). The stem sealing is done by the O-rings. The O-rings are FPM (viton) rubber. The valve is bi-directionally tight.

The valve opens when turning the manual gear to clockwise. The position indicator line at the top of the stem shows the ball's position versus the stem. The handle is aligned with pipeline when the valve is open. Also the indicator at the top of the stem is in-line with the pipeline.

Vexve Oy is not responsible for the damages caused by unknown subjects or dirtiness. Vexve Oy is also not responsible for the damages caused by improper handling or delivery.

Vexve Stainless Steel Valve (Colour grey)

Vexve stainless steel balancing valve is designed for clean mediums and specially to balancing the industrial processes. The valve is suitable to acids, alkaline waters and water with oxygen. Please consult with the manufacturer on the other applicable applications.

The valve body is from pressure equipment steel (stainless). The shaft and ball are manufactured from the stainless steel material. The ball seals are carbonized Teflon (PTFE). The stem sealing is done by the O-rings. The O-rings are FPM (piton) rubber. The valve is bi-directionally tight.

The valve opens when turning the manual gear to clockwise. The position indicator line at the top of the stem shows the ball's position versus the stem. When the valve is open the handle is aligned with pipeline. Also the indicator at the top of the stem is in line with the pipeline.

Vexve Oy is not responsible for the damages caused by unknown subjects or dirtiness. Vexve Oy is also not responsible for the damages caused by improper handling or delivery.

2. Precautions and Notifications

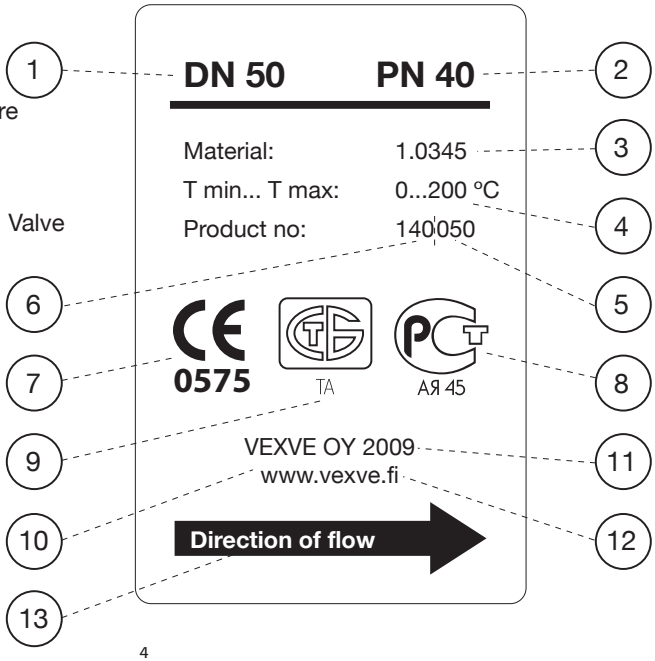
Please read and notify the following instructions before handling and operating the Vexve balancing valves:

- Check the valve's suitability to the medium and application.
- Check that the manufacturer's informed maximum temperature and pressure limits are not exceeded (chapter 8)
- Do not heat the valve unnecessary from outside.
- The installed valve at pipeline can be extremely hot! Be protected!
- The valve may not be used alone as a pipeline ending fitting. Always after the valve a blank flange needs to be welded or/and connected to the pipeline end.
- The manual gear or actuator may not been removed or dismantled if the valve is pressurized or/and it has flow.
- The valve should be un-pressurized when changing the stem O-ring(-s).
- If the pipeline is classified (I-III), check from the seller that the valve's classification meets the pipelines classification.
- Check that the measurement ends at the valve are closed.

3. Markings

The identification label locates at the valve body. It has the following information:

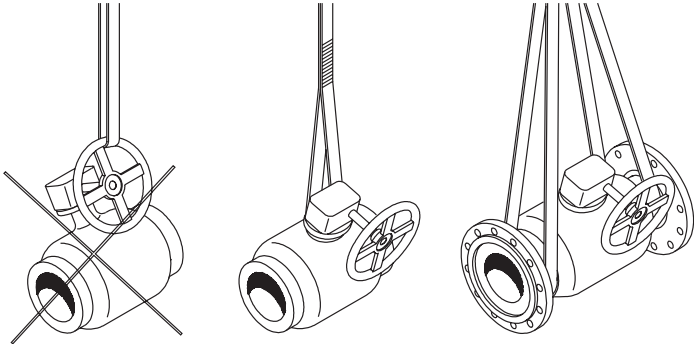
1. Valve DN size
2. Pressure class
3. Valve Body Material
4. Maximum Allowable Temperature
5. Valve Type
   14X = Steel Balancing Valve
   24X = Stainless Steel Balancing Valve
6. Valve DN size
7. CE-Mark and the number of the notified body
8. Russian Valve Certification
9. Belarus Valve Certification
10. Manufacturer
11. Manufacturing Year
12. Manufacturer's Internet Site
13. Direction of Flow



4. Valve Transportation and Storage

Please check that the valve or its parts are not damaged during the transportation. Please also check that the content of the delivery (valve types, sizes, etc.) is according to agreement. The information on the possible damages or deviations in the content must be informed immediately to Vexve Oy.

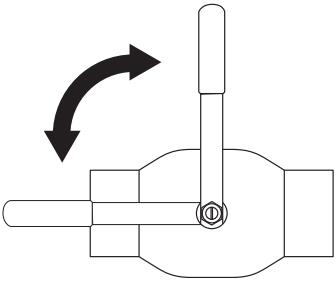
Store the valve at clean and dry storage before the installation. Do not remove the flow port protectors before the installation. Use lifting ropes when lifting the large size valves. It is forbidden to lift the valve from its actuator or stem. If needed, please check the valve's weight from Vexve Oy.

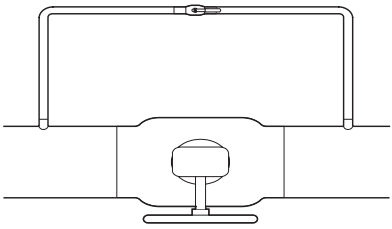


5. Installations and Welding to the Pipeline

The pipelines must be cleaned properly before installing the valves otherwise the impurities may damage the valve surfaces. During the cleaning/checking, check also that there is no dirtiness at valve due the storage or transportation. Check that the valve's maximum and minimum temperatures are not exceeded! The maximum operational pressures and temperatures can be found from the valve identification plate.

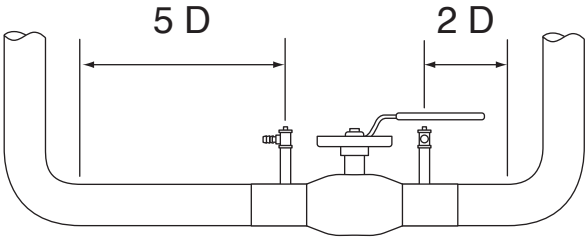
Do not remove the manual gear from the valve. If the manual gear needs to be removed during the installation, please follow the instructions how to adjust the gear and follow the instructions at chapter 7. To minimise the pressure shocks (in larger sizes DN 150 and bigger); it is recommended to use the bypass valves.



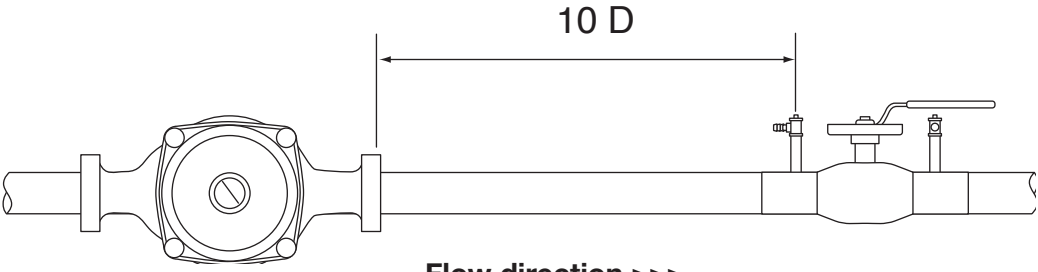


Following minimum installation distances should be followed:

In the picture D = pipeline diameter



Flow direction >>>



Flow direction >>>

5.1 Welding

It is recommended to use the electric welding (TIG, MIG).

Valve size DN 125 and bigger must be welded to the pipeline by using electric welding.

WELDING

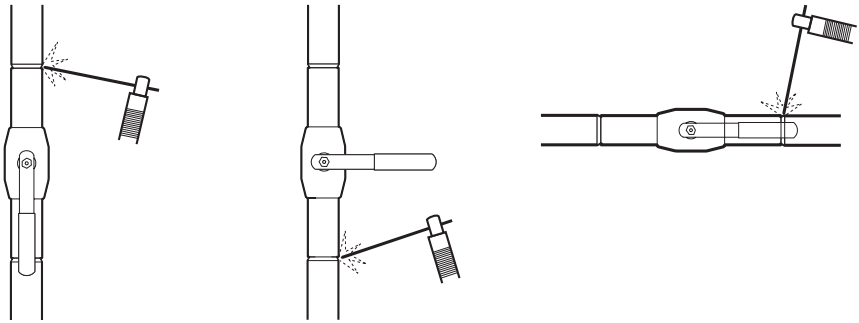
Do not overheat the valve. Use cooling during the welding. Use wet fabric to protect the valve seat from excess heat during the welding. The welder should have the proper qualification to do this kind of welding procedures

WHEN VALVE IS INSTALLED IN A HORIZONTAL POSITION:

When welding the valve, it must be in the open position - this avoids welding contamination to get in touch with the ball surface.

WHEN VALVE IS INSTALLED IN A VERTICAL POSITION:

When making the upper seam welding, the valve must be open to avoid welding contamination to get in touch with the ball surface. When making the lower welding seam the valve must be closed to avoid the overheating of the valve.



Cool down the valve (after welding) before normal operation. The valve may not be opened or/and closed after the welding before it has cooled down.

6. Commissioning and Use

The pipeline needs to be flushed carefully after the valve installation.

Commissioning Test Pressures

The largest allowable testing pressure is 1,1xPN, when the valve is closed.
During the pipeline pressure testing (1,5xPN), the valve needs to be open.

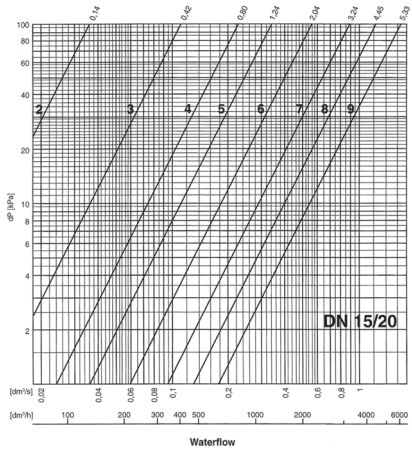
The shut-off valves are designed to be fully open or close. Check that the valve is either in open or close position against the stopper (by turning the handle 90 degrees).

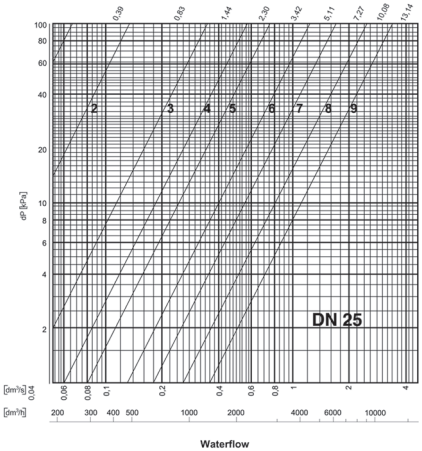
The valve may not be used alone as a pipeline ending fitting. Always after the valve a blank flange needs to be welded or/and connected to the pipeline end.

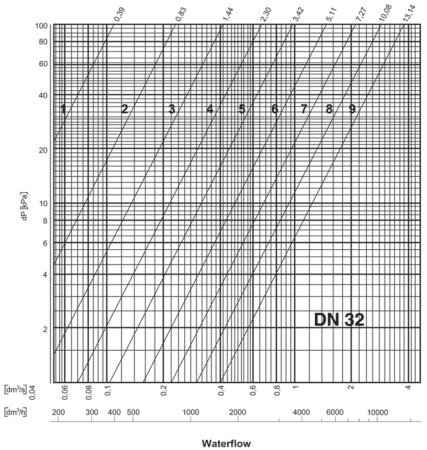
When discharging the pipelines the valve has to be turned into a half-open position in order to remove all liquid behind the ball. Important when the pipelines are discharged in temperatures below 0 ºC.

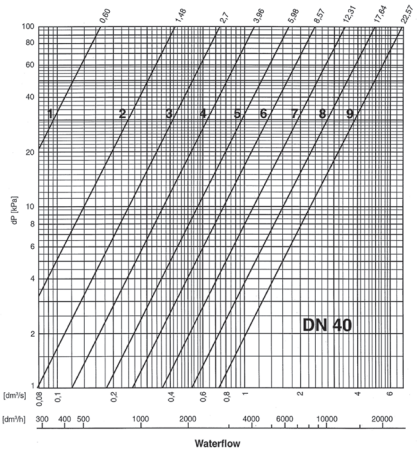
6.1 Calculating the Pre-Set Values

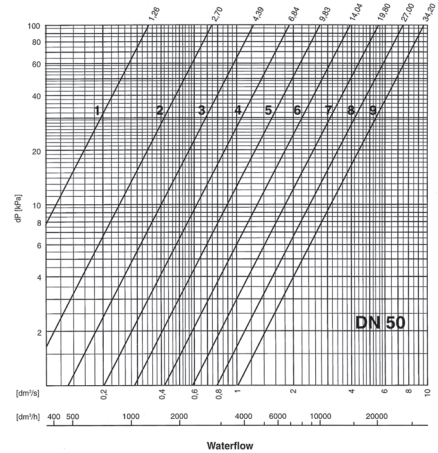
If the pre-set value is not calculated, it is possible to estimate and check the value from the following regulating curves when the flow and pressure loss in known.

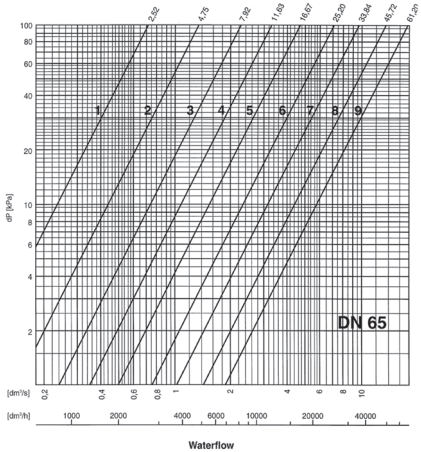


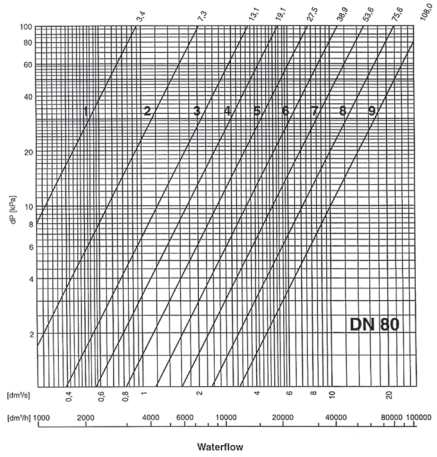


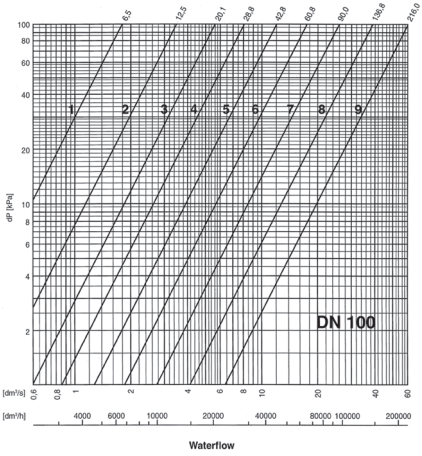

0,39
0,63
1,44
2,30
3,42
5,11
7,27
10,08
13,14
dP [kPa]
1
2
3
4
5
6
7
8
9
DN 32
[dm³/s]
[dm³/h]
0,04
0,06
0,08
0,1
0,2
0,4
0,6
0,8
1
2
4
200
300
400
500
1000
2000
4000
6000
10000
Waterflow

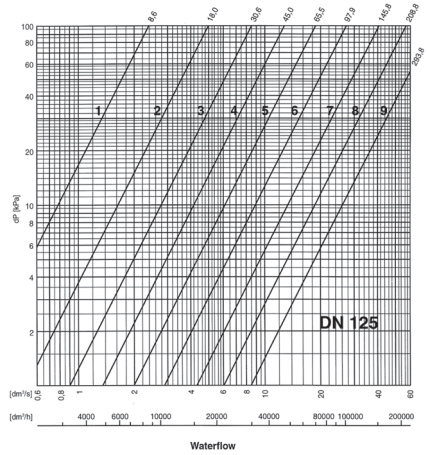

0,60
1,48
2,7
3,96
5,98
8,57
12,31
17,64
23,57
dP [kPa]
1
2
3
4
5
6
7
8
9
DN 40
[dm³/s]
[dm³/h]
0,08
0,1
0,2
0,4
0,6
0,8
1
2
4
6
300
400
500
1000
2000
4000
6000
10000
20000
Waterflow

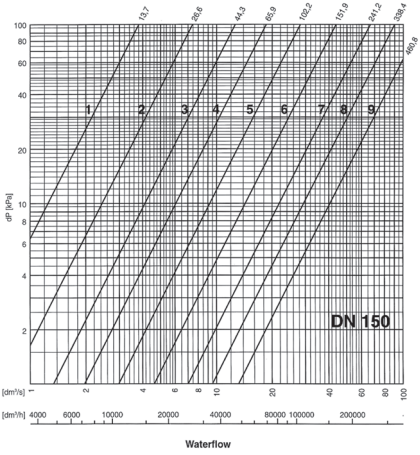

1,26
2,70
4,39
6,84
9,83
14,04
19,80
27,00
34,20
dP [kPa]
1
2
3
4
5
6
7
8
9
DN 50
[dm³/s]
[dm³/h]
0,2
0,4
0,6
0,8
1
2
4
6
8
10
400
500
1000
2000
4000
6000
10000
20000
Waterflow

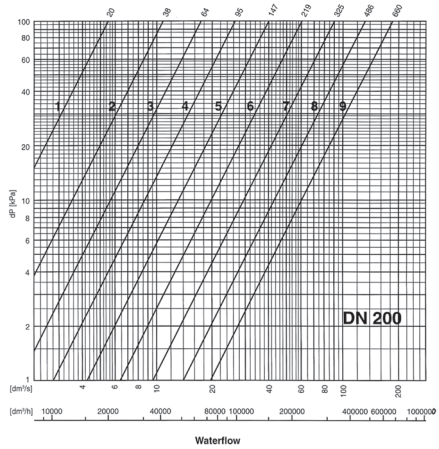

2,52
4,75
7,92
11,63
16,67
25,20
33,84
45,72
61,20
dP [kPa]
1
2
3
4
5
6
7
8
9
DN 65
[dm³/s]
[dm³/h]
0,2
0,4
0,6
0,8
1
2
4
6
8
10
1000
2000
4000
6000
10000
20000
40000
Waterflow

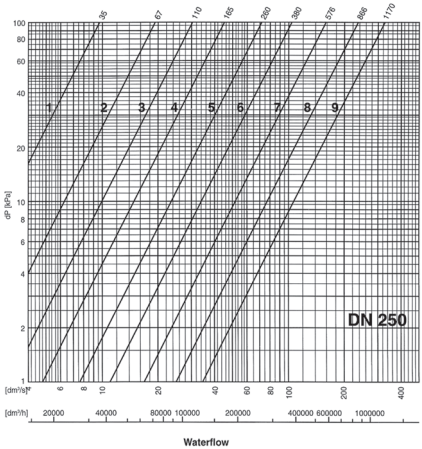

DN 80
dP [kPa]
[dm³/s]
[dm³/h]
Waterflow

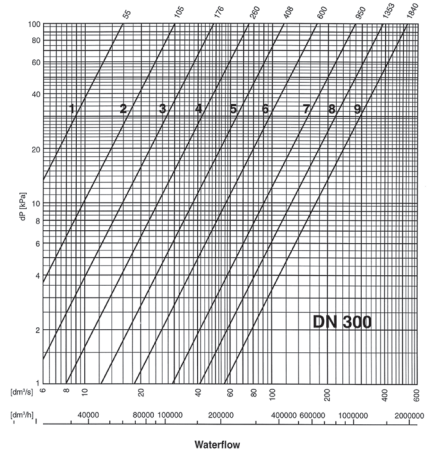

DN 100
dP [kPa]
[dm³/s]
[dm³/h]
Waterflow


DN 125
dP [kPa]
[dm³/s]
[dm³/h]
Waterflow


DN 150
dP [kPa]
[dm³/s]
[dm³/h]
Waterflow


20
38
64
95
147
219
325
486
660
1
2
3
4
5
6
7
8
9
dP [kPa]
100
80
60
40
20
10
8
6
4
2
1
DN 200
[dm³/s]
4
6
8
10
20
40
60
80
100
200
[dm³/h]
10000
20000
40000
80000
100000
200000
400000
600000
1000000
Waterflow

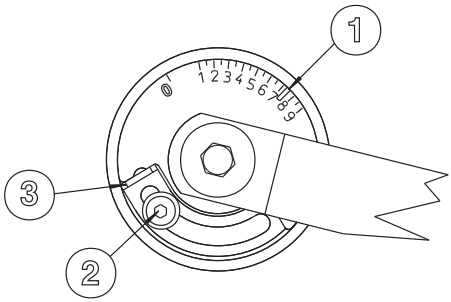

35
67
110
165
260
380
576
868
1170
1
2
3
4
5
6
7
8
9
dP [kPa]
100
80
60
40
20
10
8
6
4
2
1
DN 250
[dm³/s]
6
8
10
20
40
60
80
100
200
400
[dm³/h]
20000
40000
80000
100000
200000
400000
600000
1000000
Waterflow


55
105
176
260
408
600
900
1353
1840
1
2
3
4
5
6
7
8
9
dP [kPa]
100
80
60
40
20
10
8
6
4
2
1
DN 300
[dm³/s]
6
8
10
20
40
60
80
100
200
400
600
[dm³/h]
40000
80000
100000
200000
400000
600000
1000000
2000000
Waterflow

6.2 Setting the Pre-Set Values

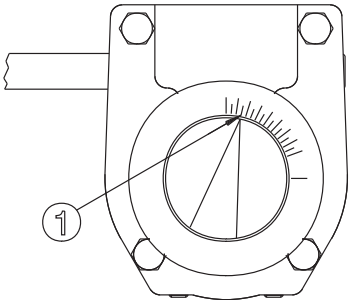
DN≤150

1. Set the correct pre-set value (1) by turning the handle
2. Open the locking screw (2)
3. Move the memory stop against the scale plate's edge (3)
4. Tighten the locking screw (2)



DN≥200

1. Set the correct pre-set value (1)



6.3 Flow Measuring

The flow measuring can be done with special flow measurement equipment. The flow measuring devices measure the flow by calculating the valve's pressure loss. The more-in-detail information for the measurements can be found from the pressure and flow meter's user manuals. More information on the suitable pressure and flow meters can be obtained from Vexve Oy.

7. Maintenance

The valves do not need extra service at the normal conditions, but to guarantee the good operation of the valves, opening and closing of the valve couple times in a year is highly recommended.

Change of O-rings
If needed, the upper O-ring at the stem can be replaced without draining the pipelines. Follow the instructions, when changing the O-ring. Take care of all special circumstances and when needed, contact the manufacturer. The O-ring change instructions can be found from the manufacturer's Internet-site www.vexve.fi or directly from Vexve Oy.

7.1 Assembly/Disassembly of Manual Gear

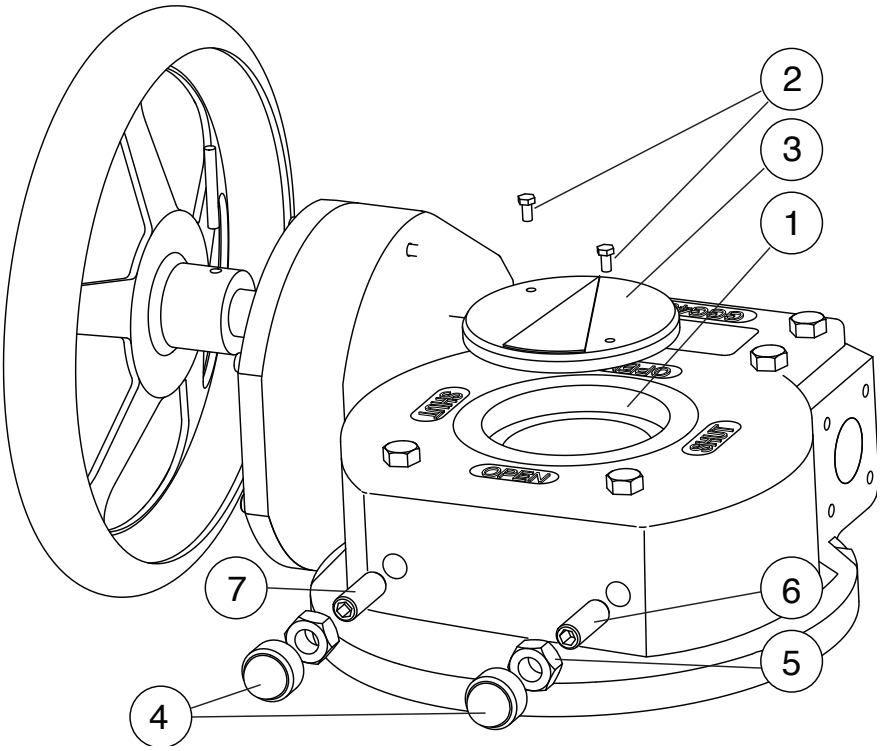
NOTE! The manual gear or actuator may not been removed or dismantled if the valve is pressurized!

NOTE! It is recommended to use the special actuator removal tools!

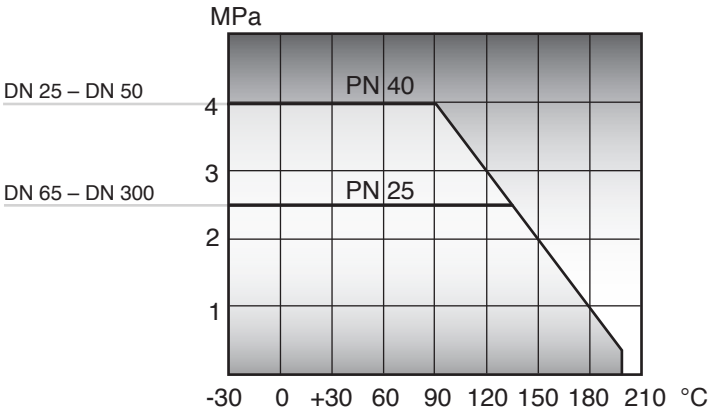
1. Turn the valve to the open position before the gear removal. The valve opens when turned the gear handle to the counter-wise direction.
2. Turn the hand wheel slightly closed (to the point when the wheel turns easily)
3. Before the gear removal, remove the position indicator plate's bolts (2), indicator plate (3) and mark the shaft position to the gear's bush. (1).
4. Remove the gear's bolts and remove the gear.
5. When assembling the manual gear, check that the stem bush adapter is in its original position. There is no need to set the gear settings again when the gear is assembled back to its original position or when turned 180 degrees. If you need to adjust the manual gear,
   please read the chapter *"7.1.1 The Adjusting of the Manual Gear"*
6. Install the gear to its position. Then install and tighten the bolts of the gear.

7.1.1 Adjusting of Manual Gear

1. Turn the valve to the open position
2. Turn the gear to the open position. Clean the shaft (at the gear) and the bush. Crease the manual gear's bush (e.g. Spray Vaseline Würth HHS 2000)
3. Install the manual gear so that the hand wheel locates at the preferred position
4. Crease and install the nuts, screws and plates
5. Install the hand wheel to the manual gear
6. Turn the valve few turns to open position.
7. Turn the valve to open position. The exact position will be checked from the valve shaft. The ball needs to be centred to its seals. If you turn the valve too much open, then the 6. and 7 paragraphs need to be done once again.
8. Remove the caps from the stop screws (4).
9. Open and loose the locking screws.
10. Tighten the open position stop screw (7) and lock the screw with the locking screw (5).
11. Turn the ball 90 degrees closed.
12. Tighten the stop position screw (6) and lock the screw with locking screw (5).


2
3
1
7
6
5
4

8. Maximum Allowable Pressure at Different Temperatures



Contact the manufacturer, if the temperature is below 0 ºC.

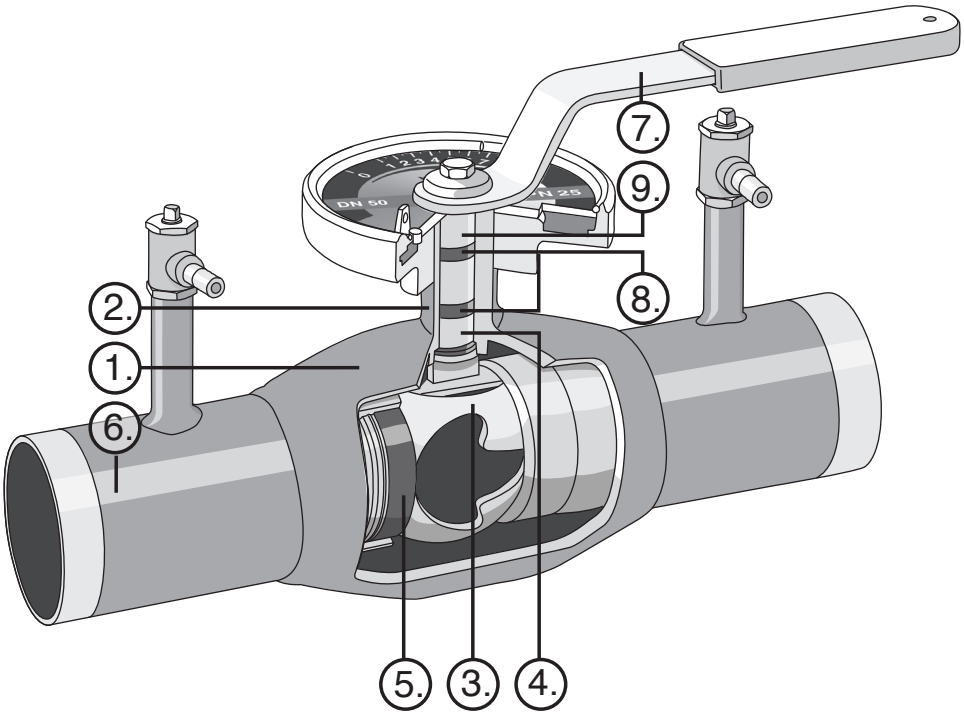
9. Kv Value Chart

Kv Values for different valve opening

Set value	DN 15/20	DN25	DN 32	DN 40	DN 50	DN 65	DN 80	DN 100	DN 125	DN 150	DN 200	DN 250	DN 300	Set value
1,0	-	-	0,39	0,60	1,26	2,52	3,42	6,48	6,84	13,68	19,7	35,0	54,5	1,0
1,5	-	0,35	0,57	1,01	1,80	3,64	5,37	9,47	13,32	20,16	20,2	51,2	80,0	1,5
2,0	0,14	0,49	0,83	1,48	2,70	4,75	7,31	12,46	18,00	26,64	38,4	66,5	105,0	2,0
2,5	0,28	0,99	1,08	2,02	3,55	6,34	10,23	16,28	24,30	35,46	51,1	90,0	142,0	2,5
3,0	0,42	1,36	1,44	2,70	4,39	7,92	13,14	20,09	30,60	44,28	63,8	110,0	176,0	3,0
3,5	0,61	1,66	1,80	3,24	5,61	9,78	16,11	24,45	37,80	55,08	79,3	140,0	220,0	3,5
4,0	0,80	2,00	2,30	3,96	6,84	11,63	19,08	28,84	45,00	65,88	95,0	165,0	260,0	4,0
4,5	1,02	2,40	2,74	4,86	8,34	14,15	23,31	35,82	55,26	84,06	121,0	215,0	336,0	4,5
5,0	1,24	3,00	3,42	5,98	9,83	16,67	27,54	42,84	65,52	102,24	147,0	260,0	408,0	5,0
5,5	1,64	3,50	4,21	7,18	11,94	20,94	33,21	51,84	81,72	127,08	183,0	325,0	510,0	5,5
6,0	2,04	4,50	5,11	8,57	14,04	25,20	38,88	60,84	97,92	151,92	219,0	380,0	600,0	6,0
6,5	2,64	5,10	5,97	10,15	16,92	29,52	46,26	75,42	121,86	196,56	282,0	500,0	785,0	6,5
7,0	3,24	6,70	7,27	12,31	19,80	33,84	53,64	90,00	145,80	241,20	325,0	576,0	950,0	7,0
7,5	3,84	7,30	8,64	14,40	23,40	39,78	64,62	113,40	177,30	289,80	417,0	740,0	1156,0	7,5
8,0	4,45	9,30	10,08	17,64	27,00	45,72	75,60	136,80	208,80	338,40	486,0	866,0	1353,0	8,0
8,5	5,04	10,00	11,52	20,88	30,60	53,46	91,80	169,20	251,30	399,80	576,0	1020,0	1594,0	8,5
9,0	5,83	12,65	13,14	22,57	34,20	61,20	108,00	216,00	293,80	460,80	660,0	1170,0	1840,0	9,0

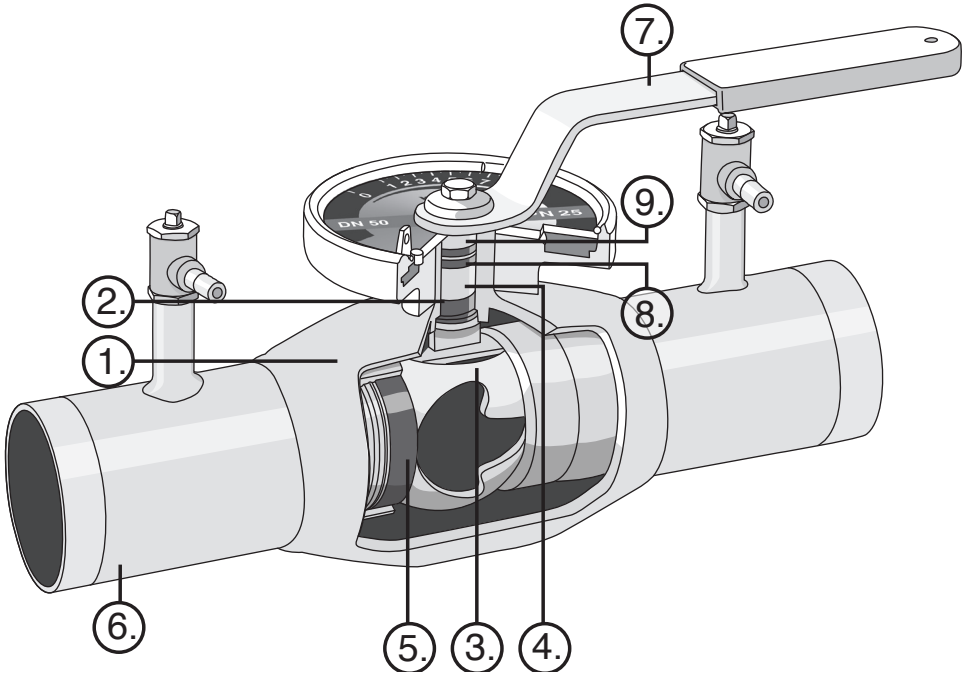
10. Materials

Vexve Steel Balancing Valves (Colour blue)



No	Description	Material
1.	Body	Steel, EN 10217-2 P235GH (1.0345)
2.	Stem bush	Steel
3.	Ball	Stainless Steel, EN X5CrNi18-10 (1.4301)
4.	Stem	Stainless Steel, EN X5CrNiS18-9 (1.4305)
5.	Ball Seals	Carbonized PTFE
6.	Extension pipes	Steel, EN 10217-2 P 235GH (1.0345)
7.	Handle	Galvanized Steel
8.	O-ring	FPM
9.	Bush	PTFE

Vexve Stainless Steel Balancing Valve (Colour grey)



No	Description	Material
1.	Body	Stainless Steel, EN 10217-7 X2CrNiMo17-12-2(1.4404)
2.	Stem bush	Stainless Steel, EN X2CrNiMo17-12-2(1.4404)
3.	Ball	Stainless Steel, EN X2CrNiMo17-12-2(1.4404)
4.	Stem	Stainless Steel, EN X2CrNiMo17-12-2(1.4404)
5.	Ball Seals	Carbonized PTFE
6.	Extension pipes	Stainless Steel, EN 10217-7 X2CrNiMo17-12-2(1.4404)
7.	Handle	Stainless Steel
8.	O-ring	FPM
9.	Bush	PTFE

Notes

Notes

VEXVE
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